Claims:

1. A process for thermal conversion of carbonaceous feedstocks selected from biomass and organic wastes, in which method

- the feedstock is fed into a fluidized-bed reactor (1-3; 41, 42, 52), wherein the feed is converted at an elevated temperature under the influence of particulate matter kept in a fluidized state by a fluidizing gas,
- the particulate matter is transferred from the reactor to a regenerator (24, 28, 29; 43-45) for regeneration and then recirculated to the reactor after the regeneration, and
- the converted hydrocarbon products are recovered from the reactor,

c h a r a c t e r i z e d by using

- a reactor (1-3), which comprises a riser (13; 41) having an axially annular cross section and being equipped with a multi-inlet cyclone (14, 17; 50) for the separation of particulate matter, and
- a regenerator (24, 28, 29; 43-45), which comprises a riser (24) having an axially annular cross section and being concentrically fitted in respect of the reactor used, said regenerator being equipped with a multi-inlet cyclone (25, 26; 51) for separation of regenerated particulate matter.

2. The process according to claim 1, wherein the reactor comprises an intershell riser space (13; 41) formed between two concentrically located cylindrical and/or conical envelope surfaces.

3. The process according to claim 1 or 2, wherein the vapour residence time of said process is 0.1 - 5 s.

4. The process according to ~~any of claims 1 to 3~~ CLAIM 1, comprising using a multiport cyclone (17) equipped with louvered vanes (14).

5. The process according to ~~any of claims 1 to 4~~ CLAIM 1, wherein the reactor (41, 42, 52) is a circulating fluidized-bed reactor optionally having a channel (52) for internal circulation.

6. The process according to ~~any of claims 1 to 5~~ claim 1, wherein the regenerator (43-45) is provided with a channel (44) for internal recirculation.

7. The process according to ~~any of claims 1 to 6~~ claim 1, wherein the regenerator is provided with a dipleg (29; 45), which communicates with the riser of the reactor.

8. The process according to ~~any of claims 1 to 7~~ claim 1, wherein the feedstock is dried in a drier (46-48) comprising a riser (46) having an axially annular cross section and being equipped with a multi-inlet cyclone (49) for the separation of dried matter from vaporized gases.

9. The process according to claim 8, wherein the drier is provided with a dipleg (48), which communicates with the riser (41) of the regenerator.

10. The process according to claim 8 or 9, wherein the drier (46-48) is provided with a channel (47) for internal circulation.

11. The process according to ~~any of claims 8 to 10~~ claim 8, wherein the dipleg (45) of the regenerator communicates with the riser of the drier (46).

12. The process according to a~~ny of the preceding claims~~ claim 8, wherein the feedstock is thermally converted at a temperature of 400 - 1000 °C.

13. The process according to ~~any of the preceding claims~~ claim 1, wherein the feedstock is selected from forestry residues and thinnings, agricultural residues, energy crops, peat, refuse derived fuel, wastes from sawmills, plywood, furniture and other mechanical forestry wastes, plastic wastes and waste slurries.

14. The process according to claim 13, wherein the feedstock is selected from straw, olive thinnings, willow, energy hay and Miscanthous.

15. An apparatus for thermally converting carbonaceous feedstocks, said apparatus

comprising

- a drying unit (46-48) for drying the feedstock,
- a reaction unit (41, 42, 52) in which the feedstock is contacted with hot, fluidized-state particulate matter, and
- a regenerator unit (43-45) for regeneration of the particulate matter contaminated in the first unit process,

c h a r a c t e r i z e d in that

- the reaction unit comprises a riser (41) with an axially annular cross section and having a multi-inlet cyclone (50) for separating solids from gas, and
- the regenerator unit comprises a circulating fluidized-bed reactor (43, 44) and a dipleg (45) fitted about the reaction unit (41, 42, 52) in a symmetrically concentric fashion, said riser (43) having an axially annular cross section and being equipped with a multi-inlet cyclone (51) for separation of solids from gas, said dipleg (45) of the regenerator unit communicating with the risers (41, 46) of the reaction unit and with the drying unit.

16. The apparatus according to claim 15, wherein the regenerator unit (43-45) comprises a channel (44) for internal recirculation of solid matter within the regenerator unit.

17. The apparatus according to claim 15 or 16, wherein the reaction unit (41, 42, 52) comprises a channel (52) for internal recirculation of solid matter within the reactor.

18. The apparatus according to ~~any of claims 15 to 17~~ CLAIM 15, wherein the drying unit (46-48) comprises a riser (46) fitted about the reaction unit in a symmetrically concentric fashion, said riser having an axially annular cross section.

19. The apparatus according to claim 18, wherein the drying unit (46-48) comprises a dipleg having an axially annular cross section and communicating with the riser (41) of the reaction unit.

20. The apparatus according to claim 18 or 19, wherein the riser (46) of the drying unit is equipped with a gas and solids separating means formed by a multi-inlet cyclone (49).